

REMARKS

Favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Initially, Applicants wish to express their appreciation to the Examiner for his courtesy and helpful suggestions made to the Applicant's representative during the personal interview held on May 31, 2006.

As suggested by the Examiner, an RCE has been filed in order to obtain entry and consideration of the new claims.

Original claims 1-14 have been cancelled without prejudice and replaced with new claims 15-27 as suggested by the Examiner. Specifically, the proposed amendments to claim 1 have been drafted into two separate independent claims 15 and 16. Support for the new claims is found in original claim 1 and the specification, for example in the paragraph bridging pages 9-10 and Examples 1 and 2 on pages 11-12 of the specification.

New claims 17-27 correspond to original claims 3-8 and 10-14, respectively.

The new claims are deemed to overcome all former grounds of rejection. As discussed during the interview, the method of producing purified marigold oleoresin according to the present invention, and the purified marigold resin produced using the method, are patentable over the cited references for the following reasons.

Madhavi et al. describe on column 2, lines 38-41 that "The process can be used to recover the carotenoids from - - - oleoresin obtained by supercritical extraction".

Namely the extract solution is used for the purpose of the known invention. However, in the present invention, the extract residue obtained by supercritical extraction is used, but the extract solution is not used. That is, the extract solution obtained by supercritical extraction is removed in the present invention. The present invention and the invention of Madhavi et al. constitute a sharp contrast to each other in this respect, which is quite unexpected and surprising.

Furthermore, Madhavi et al. describe on page 3, lines 41-44 that "The solution is allowed to stand at room temperature for about 1-4 hours until the lutein and other carotenoids separate as a fine crystalline precipitate", which are the aimed product.

Also, claim 1 of Madhavi et al. mention "A method for producing a lutein enriched mixed carotenoid product from a lutein ester source, comprising the step of -----

(d) adding aqueous solvent to said cooled solution to precipitate a carotenoid product; (3) recovering said precipitated carotenoid product”.

However, in the present invention, the precipitates in the solution by cooling are removed. This is also another sharp contrast between the present invention and Madhavi et al. The present invention removes the precipitates and uses the filtrate.

Moreover, Madhavi et al. is quite silent about using a ketone solvent, which is an essential feature of the present invention.

Thus, the claims not only differ from Madhavi et al. in requiring the organic solvent to be of the ketone family, but also differ from Madhavi et al. in using the extract residue obtained by supercritical extraction and in removal of precipitates in ketone solution by cooling.

For the foregoing reasons, the present invention is quite unobvious over Madhavi et al. to a person skilled in the art.

Kanel et al. describe on column 6, line 15 that acetone is used as a co-solvent to improve extractability of the solute(s) together with the supercritical fluid such as supercritical carbon dioxide (the dense gas).

However, in the present invention, acetone is not used for extraction, nor used together with supercritical fluids. That is, acetone is used in the present invention for making a solution to cause precipitates of unnecessary products. This is a sharp contrast between the present invention and Kanel et al.

Further Kanel et al. is quite silent about (1) subjecting marigold oleoresin to supercritical fluid extraction to remove the extract solution and (2) dissolving of marigold oleoresin in a ketone solvent, cooling the solution and removing the ingredient which precipitated in solution, which are essential features of this invention. The above features (1) and (2) are neither disclosed nor suggested in Kanel et al. The examples of Kanel et al. teach using the extraction solution, like Madhavi et al. in contrast to the present invention.

Thus, the present invention is quite unobvious over Kanel et al. to a person skilled in the art.

Furthermore, even if Madhavi et al. is combined with Kanel et al., the features of claim 15: (1) subjecting marigold oleoresin to supercritical fluid extraction to remove the

extract and use the extraction residue; and (2) dissolving of marigold oleoresin in a ketone solvent, cooling the solution and removing the precipitates from the solution are not suggested. Nor are the corresponding features of claim 16 suggested.

Table 1 of Kanel et al. teach high carotenoides extract of 46.55%, but does neither teach a high lutein content, nor a lutein-fatty acid ester content.

As is apparent from the disclosure of Example 1a of Kanel et al. the total carotenoids include α -carotene, trans- β -carotene, cis- β -carotene, β -cryptoxanthin, lutein and zeaxanthin. That is, Table 1 does not show any percent of lutein-fatty acid ester, as recited in claims 23-26 of the present invention.

Madhavi et al. describe in column 3, lines 62-65 the percentages of carotenoids and lutein, but does not describe the content of lutein-fatty acid ester.

With regard to the viscosity, as is apparent from the disclosure on column 3, lines 14-16 of Madhavi et al., the free flowing isopropanol solution of marigold oleoresin is described, but the viscosity of marigold oleoresin itself is not described.

Thus, the subject matter of claims 23-26 are not obvious over the cited references to a person skilled in the art.

In view of the foregoing, it is respectfully submitted that the new claims are non-obvious and patentable over the teachings of the cited references. Accordingly, reconsideration and allowance is solicited.

Respectfully submitted,

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